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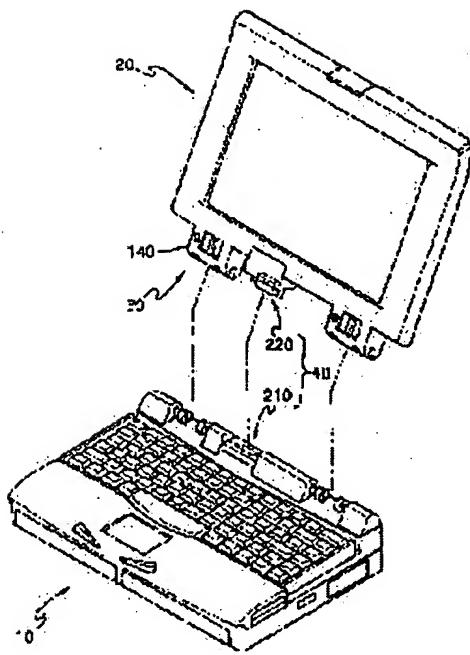
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(54) DISPLAY COUPLING STRUCTURE OF ELECTRONIC PRODUCT



(57)Abstract:

PROBLEM TO BE SOLVED: To provide a display coupling structure of electronic products.

SOLUTION: This display coupling structure is characterized by including a main body 10, a display 20 in which an image signal from the main body is inputted and to display it, hinge pins (120,130) to be freely rotatably provided for the main body, a mounting means 30 to include a housing provided for the display to be coupled with the hinge pins and to be rotated together when it is mounted and an optical connector 40 to be provided to mutually correspond to each of the main body and the display and to transmit

the image signal by using light. Thus, the display is easily attached and detached to/from the main body. Consequently, the display can be replaced with the one with better resolution and larger screen size and to be easily portable.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the display joint structure of an electronic product which has a display, and relates to a detail at the display joint structure of the electronic product the display was able to make attachment and detachment free to the body.

[0002]

[Description of the Prior Art] Generally, it has a display like a notebook sized personal computer, a web video phone, and a digital camcorder, and, as for the portable electronic product, the body and the display are unified. Drawing 1 is

the perspective view showing a notebook sized personal computer as an example of an electronic product which has the conventional display. The shown notebook sized personal computer possesses the body 1 which contains the computer system, and the display 3 which displays an image according to the picture signal told from this body 1.

[0003] Input devices which can input operating instructions, such as a keyboard and a mouse, and peripheral devices, such as a hard disk drive, CD-ROM, a modem, and a LAN card, and the sound equipment which can offer an audio are combined with said body 1. Said display 3 is an output unit which outputs the information offered from the body 1 to an image gestalt, and hinge association of the closing motion of it is enabled at the 1 side of a body 1. Moreover, a display 3 is electrically connected with a body 1 by the ribbon mold cable 5.

[0004] Since direct hinge association of the display 3 was carried out at the body 1 and between a body 1 and displays 3 was electrically connected through the ribbon mold cable 5, separation of the display 3 to a body 1 was impossible for the electronic product which has the display constituted as mentioned above.

That is, when the defect of a body or a display occurs or a life goes out, or when it is going to change the magnitude of a display, a user cannot change a display direct picking. Moreover, a ribbon mold cable is exposed outside and a fine sight top is not good.

[0005]

[Problem(s) to be Solved by the Invention] The purpose of this invention is offering the display joint structure of the electronic product which can detach and attach a display to a body, in order to solve said trouble.

[0006]

[Means for Solving the Problem] The display joint structure of the electronic product concerning this invention for attaining said purpose A body and the display which the picture signal from said body is inputted and is displayed, The hinge pin prepared in said body free [rotation] and housing with which said display was equipped so that it might be combined [both] with said hinge pin at the time of wearing and might rotate are included. It is characterized by including the wearing means for combining said display with said body, enabling free wearing and free attachment and detachment, and the optical connector which each of said body and said display is equipped with so that mutual correspondence may be carried out, and transmits a picture signal using light.

[0007] As for said housing, it is desirable to include the housing fuselage which has a front frame and a rear frame and was fixed to said display, and the hinge bracket with which the joint slot which is prepared in said housing fuselage and inserted in relatively [hinge pin / said] at the time of wearing was formed here. Moreover, as for said wearing means, it is desirable to be combined with said

body and to include further the bearing bracket which supports said hinge pin so that it may be exposed outside.

[0008] Said wearing means includes further a locking, and the locking / discharge means for making it cancel for said housing and said hinge pin.

Moreover, said locking / discharge means The locking member prepared free [migration] in said housing so that it could join together and cancel to the locking slot formed in the head of said hinge pin, It is desirable to include the elastic member which it is prepared [elastic member] in said housing and makes said locking member energize in the direction combined with said locking slot, and the release lever which protruded on said locking member so that it might be exposed to the guide hole formed in said housing and could move.

[0009] Moreover, it is desirable for the guide slot for guiding association to said locking slot of said locking member to the head of said hinge pin to have inclined, and to have formed it. Moreover, as for said optical connecter, it is desirable to include the light-receiving module prepared in said display so that may have the laser diode array which irradiates light in independent respectively according to a driving signal, it may have the photodiode array which carries out photo electric conversion of the received incident light to the luminescence module which is combined [both] with said hinge pin and rotates in independent respectively, coupling may be carried out [both] to said luminescence module at

the time of wearing and it may rotate.

[0010] Moreover, it is desirable to have been prepared so that said laser diode array might be exposed to the aforementioned lead-in circles including the 1st holder with which the lead-in section by which said luminescence module is supported by said hinge pin, and said photodiode array is relatively inserted in a plane of union with said light-receiving module was formed.

[0011] Moreover, as for said light-receiving module, it is desirable to include the 2nd holder with which said photodiode array is supported by the projected point, the base in which the clear aperture for being prepared in said display and supporting said 2nd holder movable in and abroad was formed, and the elastic member made to energize so that it may be prepared in the interior of said base and said 2nd holder may be exposed outside through said clear aperture.

[0012] Said optical connecter guides wearing of said luminescence module and said light-receiving module, and the positioning means for preventing a ranging behavior at the time of wearing is included further. Moreover, said positioning means Two or more criteria holes by which lead-in formation was carried out at the plane of union of said luminescence module or said light-receiving module, It is desirable to include the guide pin prepared in the remaining modules so that said criteria hole might be countered and said luminescence module or a light-receiving module might be countered, and the pressurization member for

energizing the 1 side of said luminescence module to the shaft orientations of said hinge pin.

[0013] moreover, said wearing means -- the inside of said each criteria hole -- flexible -- a round trip -- with the 1st Maine electrode of the pair prepared

movable The pressurization member which pressurizes each of said 1st Maine electrode flexibly outside is included. Said guide pin It is desirable to carry out electrical connection to each of said 1st Maine electrode at the time of wearing,

and to include the 2nd Maine electrode of the pair formed with the conductive quality of the material so that the Maine power source between said bodies and said displays might be connected.

[0014] Moreover, a switching means to cut gradually energization between said

1st Maine electrodes and said 2nd Maine electrodes, or to connect it is further

included at the time of separation or wearing of said body and said display. The

interior of said luminescence module is equipped with said switching means so

that it may correspond to each of said 1st Maine electrode. The elastic switch of

the pair located in the isolation distance which is different from each other from

said 1st Maine electrode so that said 1st Maine electrode may be gradually

contacted / separated at the time of approach and isolation is included. After

each of said elastic switch and said 1st Maine electrode is gradually separated

at the time of separation, it is desirable to have came to separate the 1st Maine

electrode and said 2nd Main electrode.

[0015] Moreover, the 1st holder supported that lead-in formation of the lead-in section in which said photodiode array is inserted at the time of wearing is carried out at an apical surface, and said luminescence module has so that [said laser diode array] it may be exposed to the aforementioned lead-in circles, It is desirable to include the elastic member which supports said 1st holder movable in and abroad so that the aforementioned lead-in section may meet said light-receiving module, is prepared in the 1st case prepared in said body free [rotation] and said 1st case, and energizes said 1st holder outside.

[0016] Said optical connector contains further the connection unit for making it connect so that the optical transmission of said luminescence module and said light-receiving module can be carried out on a long distance. Said connection unit The optical fiber bundle for transmitting each of the light which it was prepared so that said luminescence module and said light-receiving module might be faced, and was irradiated from said laser diode array to said light-receiving module, It is desirable to include the 1st coupler which combines the end of said optical fiber bundle so that said luminescence module may be faced, and the 2nd coupler which combines the other end of said optical fiber bundle so that said light-receiving module may be faced.

[0017] Moreover, a light-receiving array for said 1st coupler to receive each of

the light irradiated from said luminescence module, The 1st holder supported so that said light-receiving array may be connected with a point by the end of said optical fiber bundle, The 1st fuselage in which said 1st holder was supported movable in and abroad, and the passage hole was formed, The elastic member prepared in said 1st fuselage so that said 1st holder might be energized outside, In order to cancel association of the hook member prepared in said 1st fuselage, and said hook member so that it may be stopped by the stop slot formed in said luminescence module while elastic deformation is carried out at the time of association, it is desirable to include the release button prepared in and abroad movable through said passage hole.

[0018] Moreover, a luminescence array for said 2nd coupler to irradiate each of the light transmitted through said optical fiber bundle, The 2nd holder supported so that said luminescence array may be connected with a point by the other end of said optical fiber bundle, The 2nd fuselage in which said 2nd holder was supported free [migration to inside and outside], and the passage hole was formed, The elastic member prepared in said 2nd fuselage so that said 2nd holder may be energized outside, In order to cancel association of the hook member prepared in said 2nd fuselage, and said hook member so that it may be stopped by the stop slot formed in said light-receiving module while elastic deformation is carried out at the time of association, it is desirable to include the

release button prepared in and abroad movable through said passage hole.

[0019] Moreover, according to separation and wearing of said display and said body, intercept alternatively power-source connection to said luminescence module and said light-receiving module, or it is connected. The current supply / a cutoff means to interrupt the drive of said laser diode at the time of separation are included further. Said current supply / cutoff means The auxiliary power for the drive of said laser diode array, and the mechanical component which it prepares [mechanical component] for said body and makes said laser diode drive, The 1st auxiliary electrode of a pair with which it is prepared in said luminescence module, and the each is electrically connected with each of said mechanical component and said auxiliary power, It is desirable to include the 2nd auxiliary electrode of a pair respectively connected electrically so that it might be prepared in said light-receiving module so that it may connect with said each 1st auxiliary electrode at the time of association of each of said module, and the power of said auxiliary power might be told to said mechanical component through said 1st auxiliary electrode.

[0020] Moreover, as for said current supply / cutoff means, it is desirable to include further the gang switch of a pair which was formed in the interior of said luminescence module so that it might correspond to each of said 1st auxiliary electrode, was located in the isolation distance which is different from each other

from said 1st auxiliary electrode so that it might energize or connect with said 1st auxiliary electrode and phase target too hastily while elastic deformation was carried out at the time of wearing or separation, and was electrically connected with each of said mechanical component and said auxiliary power.

[0021] Moreover, attachment and detachment of the display are restricted so that said display can detach and attach only at a predetermined

attachment-and-detachment include angle to said body. The attachment-and-detachment include-angle accommodation means which makes wearing easy is included further. Said attachment-and-detachment

include-angle accommodation means It is desirable to include said hinge pin, the 1st controller which restricts the attachment-and-detachment include angle of

said housing, and the 2nd controller for restoring the posture of said optical connector automatically [so that it may be in agreement with the attachment-and-detachment include angle adjusted by said 1st controller].

 [0022] Moreover, the stop pin formed so that said 1st controller might be projected to the side face of said housing, The guide rail to which it is prepared in

said body so that said some of hinge pins may be covered, and it is formed in the side corresponding to said stop pin, and shows the path of insertion of said stop pin, Out of said attachment-and-detachment include angle, it is desirable to

include the covering member which has the stop slot by which lead-in formation

was carried out by extending in said guide rail so that attachment and detachment of said stop pin might be controlled.

[0023] Moreover, the tubed 1st hold section which said 2nd controller was prepared in said body, and protruded on the 1 side in the predetermined radius, The supporter material to which only predetermined distance has the 2nd hold section by which extended formation of the bore was carried out in a circumferencial direction from the inside of the 1st hold section so that a stop pawl may be formed from a boundary with said 1st hold section, The rotation member to which the supporter protruded on the circumferencial direction so that an end might be combined with said optical connecter, the other end might be held in said 1st hold circles free [rotation] and it might correspond to said 1st hold section, It is prepared between said rotation members and said supporter material so that it may be alternatively supported by the edge each [edge] of both ends was severed to the circumferencial direction of said supporter, and said stop pawl. The rotation spring which offers stability is included in said rotation member by pushing an end on said piece of support, and deforming it flexibly at the time of rotation of said rotation member. Said rotation member It is desirable to carry out posture immobilization so that it may rotate according to the rotation force of said rotation spring and said attachment-and-detachment include angle may be maintained.

[0024] Moreover, as for said 2nd controller, it is desirable to include further the pressurization spring which is prepared between said rotation members and said optical connecters, and pressurizes said rotation member flexibly at said supporter material side. Moreover, it is desirable in lead-in formation of the rotation stop slot corresponding to said rotation stop pawl having been carried out from the periphery in the joint slot by which lead-in formation was carried out so that said rotation member might be inserted in the 1 side of said optical connecter, and the joint edge which the rotation stop pawl projected from the joint slot inside is formed so that relative rotation may be prevented, and is inserted in said joint slot of said rotation member.

[0025] Moreover, as for said laser diode array, it is desirable to have came to prevent that are prepared so that it may be exposed to the plane of union of said luminescence module to the medial surface of the lead-in section by which lead-in formation was carried out, said photodiode array is prepared so that it may be exposed to the side face of the lobe corresponding to the aforementioned lead-in section of said light-receiving module, and the light irradiated from said laser diode array goes to the outside of the aforementioned lead-in section.

[0026]

[Embodiment of the Invention] Hereafter, with reference to the attached drawing,

it explains to a detail to the desirable operation gestalt of this invention. Drawing 2 is the separation perspective view showing the display joint structure of the electronic product concerning the 1st operation gestalt of this invention. Drawing 3 is the fractional separation perspective view of drawing 2 , and each of drawing 4 and drawing 5 is the fragmentary sectional view of drawing 2 . The electronic product shown in drawing 2 is a notebook sized personal computer which has a display.

[0027] If drawing 2 thru/or drawing 5 are referred to, the display joint structure concerning the 1st operation gestalt of this invention A body 10 and the display 20 which the picture signal from this body 10 is inputted, and is displayed, The optical connector 40 formed in each of a body 10 and a display 20 so that mutual correspondence may be carried out is provided so that it can equip with a display 20 to a body 10, and a picture signal may be transmitted using a body 10, the wearing means 30 with which each of a display 20 is equipped, and light.

[0028] It is combined with each of said hinge pins 120 and 130 at two or more bearing brackets 110 prepared in the body 10 by carrying out predetermined spacing isolation, the hinge pins 120 and 130 prepared in each of said bearing bracket 110 free [rotation], and the time of wearing, and said wearing means 30 possesses a locking, and the locking / discharge means for making it cancel for the housing 160 prepared in the display 20 so that it might both rotate, and hinge

pins 120 and 130 and housing 160.

[0029] The friction member 112 which provides hinge pins 120 and 130 with predetermined frictional force is formed in said bearing bracket 110. Therefore, free rotation is controlled and hinge pins 120 and 130 rotate only according to external force. Moreover, each of said hinge pins 120 and 130 has heads 121 and 131 and the stop sections 123 and 133 which have a predetermined cross-section configuration so that the hinge bracket 150 mentioned later may be applied. Moreover, both the edges of said hinge pin 130 have a square cross-section configuration so that said optical connector 40 may be combined free [rotation]. Here, each of said bearing bracket 110 and hinge pins 120 and 130 is covered with a body 10 with the removable covering 12 (refer to drawing 4).

[0030] Said housing 160 possesses the housing fuselage 140 which has the rear frame 143 combined with the front frame 141 and this front frame 141, and the hinge bracket 150 prepared in said housing fuselage 140. It is fixed to a display 20 and said housing fuselage 140 is desirably formed in a display 20 and one. Moreover, the penetration hole H is formed in the housing fuselage 140 bottom so that the head 121 of hinge pins 120 and 130 and 131 parts may pass at the time of wearing. Said hinge bracket 150 is combined by **** S between the front frame 141 and the rear frame 143. The joint slot 151 inserted in relatively [each /

of said stop sections 123 and 133] is formed in the both ends of the hinge bracket 150. Therefore, at the time of wearing, when the joint slot 151 is relatively stopped by the stop section 123, both the hinge bracket 150 and the hinge pins 120 and 130 are rotated, and it gets. A display 20 is opened and closed to a body 10, and it deals in it as a result.

[0031] Said locking / discharge means possess the release lever 190 for making locking association of the locking slot 125 formed in the head 121 of a hinge pin 120, the locking member 170 prepared free [migration] in the housing fuselage 140 so that it could join together and cancel to a locking slot 125, and the elastic member 180 which makes the locking member 170 energize in the direction combined with a locking slot 125 and the locking member 170 cancel.

[0032] Said locking member 170 has the body 173 with which the through tube 171 was formed, and the locking rod 175 with which this body 173 is equipped and by which locking association is carried out in said locking slot 125. An end is connected with said body 173, the other end is connected with the front frame 141, and the locking member 170 is made, as for said elastic member 180, to energize in the direction by which locking association is carried out. The long hole 145 formed in the front frame 141 of the housing fuselage 140 is passed, it is combined with a fuselage 173, and said release lever 190 becomes movable within a long hole 145. Moreover, a release lever 190 has the elastic hook 191 of

the pair in which elastic deformation is possible so that it may be combined with the through tube 171 of a fuselage 173.

[0033] Moreover, the guide slot 127 is inclined and formed in the head 121 of a hinge pin 120 as a guide means for guiding association to the locking slot 125 of said locking rod 175 at the time of wearing. Said optical connector 40 guides wearing of the luminescence module 210 prepared in a body 10 free [rotation], and the light-receiving module 220 prepared in a display 20 so that it may correspond to said luminescence module 210, and the luminescence module 210 and the light-receiving module 220, and possesses the positioning means for preventing a ranging behavior at the time of wearing.

[0034] Said luminescence module 210 possesses the laser diode array 211 which irradiates light in independent respectively according to a driving signal, and the 1st holder 213 supported by said hinge pin 130 free [rotation]. Said laser diode array 211 is formed so that it may be exposed to the plane of union of the 1st holder 213 in the lead-in section 214 by which lead-in formation was carried out. Such a laser diode array 211 consists of much laser diodes. The 1 side of said 1st holder 213 is equipped with 1st axial groove 210a of a predetermined configuration so that it may correspond to the edge of a hinge pin 130. Moreover, lead-in formation of the 2nd axial groove 210b is carried out at a side besides the 1st holder 213 so that it may correspond to the shank 11

formed in the body 10. The cable C connected with the laser diode array 211

through said 2nd axial groove 210b and shank 11 is formed.

[0035] Said light-receiving module 220 supports the photodiode array 221 which

carries out photo electric conversion of the received incident light in independent

respectively, the 2nd holder 223 which supports said photodiode array 221 to a

point, and the 2nd holder 223 movable in and abroad, and possesses the base

225 established in a display 20, and the elastic member 227 prepared in the

base 225 so that said 2nd holder 223 might be made to energize outside. Said

photodiode array 221 consists of many photodiodes. The 2nd holder 223 is

projected outside through the clear aperture formed in the base 225 so that the

point might be inserted in the lead-in section 214 of the 1st holder 211 at the time

of wearing.

[0036] Said positioning means possesses the pressurization member 219

prepared in 2nd axial groove 210b, in order to energize the 1 side of the guide

pin 228 prepared in said base 225, and the luminescence module 210 so that it

may correspond to criteria hole 210c formed in lead-in section 214 perimeter of

the 1st holder 211, and this criteria hole 210c. Being incorrect-equipped is

prevented by inserting a guide pin 228 in criteria hole 210c at the time of

association of the luminescence module 210 and the light-receiving module 220.

Moreover, when the 1st holder 213 is energized by the pressurization member

219 at a hinge pin 130 side, the movement toward right and left is prevented.

[0037] Moreover, the 1st Maine electrode 216 of a pair is formed in each criteria hole 210c as said wearing means for the electrical connection between a body 10 and a display 20. This 1st Maine electrode 216 is energized outside by the elastic member 212 prepared in criteria hole 210c. Moreover, said guide pin 228 possesses 2nd Maine electrode 228a of a pair so that it may connect with the 1st Maine electrode 216 electrically at the time of wearing. By being formed with the conductive quality of the material, said 2nd Maine electrode 228a guides wearing of each modules 210 and 220, and carries out two functions to which electrical connection of between a body 10 and displays 20 is carried out after wearing. Moreover, a switching means to cut gradually energization with the 1st Maine electrode 216 and 2nd Maine electrode 228a, or to connect is further equipped at the time of separation or wearing of said body 10 and display 20.

[0038] Said switching means possesses the elastic switches 218a and 218b of the pair prepared in the interior of the 1st holder 213 so that it might correspond to each of the 1st Maine electrode 216. Said each elastic switches 218a and 218b are formed by the separation which is different from each other from the 1st Maine electrode 216 so that said 1st Maine electrode 216 may be gradually contacted / separated at the time of approach and isolation. And elastic switch 218a located distantly [electrode / 216 / 1st Maine] desirably is connected with

the Maine power source 231 of a body 10, and other elastic switch 218b is connected with the ground section (not shown) of a body 10. Therefore, connection of the 1st Maine electrode 216 and elastic switch 218a is first separated at the time of separation of a display 20. Then, after the current supply from the Maine power source 231 is intercepted, connection of other elastic switch 218b is separated. Thus, when power-source connection of a display 20 connects with a body 10 too hastily gradually, possibility of generating a fatal error decreases to IC for a drive (not shown) or the circuit of a body (not shown) of a display 20 at the time of separation.

[0039] Moreover, at the time of separation of a display 20 and a body 10, and attachment and detachment, the power-source connection between the luminescence module 210 and the light-receiving module 220 is intercepted alternatively, or it connects, and the current supply / a cutoff means to interrupt the drive of laser diode at the time of separation are equipped further. Current supply / cutoff means possesses the auxiliary power 232 with which a body 10 is equipped, the mechanical component 233 which it prepares [mechanical component] for a body 10 and makes a laser diode drive, the 1st auxiliary electrode 217 of a pair which is prepared in the luminescence module 210 and is electrically connected with each of auxiliary power 232 and a mechanical component 233, and the gang switches 238a and 238b of 2nd

auxiliary-electrode 228b of the pair which protruded on the plane of union of the base 225 so that it might correspond to the 1st auxiliary electrode 217, and a pair.

[0040] The 1st auxiliary electrode 217 of said pair is formed movable in said criteria hole 210c. Moreover, the 1st auxiliary electrode 217 is energized outside by the elastic member 212 prepared in criteria hole 210c. Each of such 1st auxiliary electrode 217 is pressed down by said 2nd auxiliary-electrode 228b, and is flexibly connected with each of gang switches 238a and 238b. Said 2nd auxiliary-electrode 228b has the function which is included in said guide pin 228 and guides association, and other functions electrically connected to the 1st auxiliary electrode 217 at the time of association. Such 2nd auxiliary-electrode 228b is connected mutually electrically.

[0041] At the time of separation of a display 20 and a body 10, it has said each gang switches 238a and 238b so that the luminescence module 210 and the light-receiving module 220 may separate power-source connection gradually. Such gang switches 238a and 238b are formed in the 1st holder 213 interior possible [elastic deformation] so that it may correspond to each of the 1st auxiliary electrode 217. Moreover, each of said gang switches 238a and 238b is located in the isolation distance which is different from each other from the 1st auxiliary electrode 217. Desirably, gang switch 238a connected with auxiliary

power 232 is prepared more distantly than gang switch 238b connected with the mechanical component 233.

[0042] Therefore, when a body 10 is equipped with a display 20, the 1st auxiliary electrode 217 pressed down by 2nd auxiliary-electrode 228b is electrically connected with each of gang switches 238a and 238b. Then, the power of auxiliary power 232 is told to a mechanical component 233, and the laser diode array 211 drives. When a display 20 and a body 10 are divided into the opposite side, each electrodes 217 and 228b and gang switches 238a and 238b are short-circuited, and the drive of the laser diode array 211 stops. Under the present circumstances, the current supply from auxiliary power 232 goes out previously. Therefore, it can prevent that a mechanical component 233 and the laser diode array 211 break down by interruption of service. Moreover, the laser diode array 211 can prevent that stop irradiating light and a user is exposed to light at the moment of a display 20 being separated.

[0043] Actuation of the display joint structure of the electronic product concerning the 1st operation gestalt of this invention which has said configuration is explained. First, in order to make a body 10 equip with a display 20, a display 20 is brought close to a body 10 in the condition that it was shown in drawing 4. Then, the locking rod 175 is pushed on 1 side along the guide slot 127. And a display 20 is made to approach further, the locking rod 175 meets a

locking slot 125, location restoration is carried out and the locking rod 175 is combined with a locking slot 125. the joint slot 151 of this, simultaneously the hinge bracket 150 -- hinge pins 120 and 130 -- it is attached in each stop sections 123 and 133.

[0044] Moreover, 2nd Maine electrode 228a is inserted in criteria hole 210c, and extrudes each of the 1st Maine electrode 216 to the elastic switch 218a and 218b side. Then, the 1st Maine electrode 216 is first connected to elastic switch 218b, and other elastic switch 218b is connected to elastic switch 218a later.

Moreover, while said 2nd auxiliary-electrode 228b is also inserted in this and coincidence into criteria hole 210c, the 1st auxiliary electrode 217 is extruded to the gang switch 238a and 238b side. Then, it connects with gang switch 238b of a near place previously, and the 1st auxiliary electrode 217 is connected to other gang switch 238a later.

[0045] If it becomes such, where predetermined spacing isolation is carried out so that optical transmission may be possible the laser diode array 211 and between photodiode array 221, it will face each other. Moreover, power is supplied to a display 20 from the Maine power source 231. And the power of auxiliary power 232 is told to a mechanical component 233, and the laser diode array 211 will be in the condition which can be driven. Moreover, closing motion of a display 20 is attained, rotating to a body 10 by rotation of hinge pins 120 and

130.

[0046] On the other hand, when it is going to separate a display 20 from a body

10, a release lever 190 is moved to drawing 5, as the imaginary line showed.

Then, the locking rod 175 escapes from and comes out from a locking slot 125.

Then, if a display 20 is gradually moved in the direction isolated from a body 10,

a display 20 and a body 10 will be separated. Under the present circumstances,

as mentioned above, each of the 1st Maine electrode 216, 2nd Maine electrode

228a, and the elastic switches 218a and 218b is short-circuited one by one.

Moreover, each of the 1st auxiliary electrode 217, 2nd auxiliary-electrode 228b,

and gang switches 238a and 238b is also short-circuited one by one.

[0047] Therefore, the electric power supply to the display 20 from a body 10

stops. And since the electric power supply from auxiliary power 232 to a

mechanical component 233 also stops, the drive of the laser diode array 211

stops. Even if it mistakes in the condition of not intercepting the power source

(not shown) of a body 20, for example, and makes a display 20 separate as all

current supply stops at the time of separation of a body 10 and a display 20, it

stops thus, irradiating light from the laser diode array 211. Therefore, a user can

be safely protected from light.

[0048] Drawing 6 and drawing 7 are the sectional views having extracted and

shown the optical connector of the display joint structure concerning the 2nd

operation gestalt of this invention. As shown, an optical connector 50 possesses the luminescence module 310 prepared in a body 10 free [rotation], and the light-receiving module 320 fixed to a display 20.

[0049] Said luminescence module 310 possesses the laser diode array 311, the 1st holder 313, and the 1st case 315 and an elastic member 317. Said laser diode array 311 is the same member as the reference mark 211 explained by drawing 4 . Said 1st holder 313 supports the laser diode array 311. Moreover, lead-in formation of the lead-in section 314 is carried out with predetermined depth at the point of the 1st holder 313. It is prepared so that said laser diode array 311 may be exposed to the pars basilaris ossis occipitalis of the aforementioned lead-in section 314. Such 1st holder 313 is held within and without the 1st case 315 movable so that the lead-in section 314 may be exposed outside. The 1 side of said 1st case 315 is combined with a hinge pin 130, and the other end is combined with the shank material 316 prepared in the body 10 free [rotation].

[0050] Therefore, the 1st case 315 is rotatable considering a hinge pin 130 and the shank material 316 as a core. Moreover, the cable C connected with the mechanical component 233 (refer to drawing 4) of a body 10 passes the hollow of the shank material 316, and is connected with the laser diode array 311. Said elastic member 317 is formed in the 1st case 315, and pressurizes the 1st holder

313 flexibly on the outside of the 1st case 315.

[0051] Said light-receiving module 320 possesses the photodiode array 321, the 2nd holder 323 which supports the photodiode array 321 to the point corresponding to the aforementioned lead-in section 314, and the 2nd case 325 and an elastic member 327. The photodiode array 321 is the same member as the drawing sign 221 of drawing 4. The 2nd holder 323 is held in the 2nd case 325 interior movable, and it is energized so that it may be exposed to the outside of the 2nd case 325 by the elastic member 327. Therefore, at the time of wearing, the point of the 2nd holder 323 is inserted in the lead-in section 314, and the photodiode array 321 and the laser diode array 311 carry out predetermined spacing isolation, and it faces each other.

[0052] Moreover, two or more criteria holes 318 are formed in the 1st case 315.

And the guide pin 328 corresponding to the criteria hole 318 is formed in the 2nd case 325. Said guide pin 328 has the same function as 2nd Maine electrode 228a and 2nd auxiliary-electrode 228b which were explained by drawing 4. Therefore, in the criteria hole 318, the electrode 312 flexibly pressurized outside by the elastic member 319 is formed. It has the same function as the 1st Maine electrode 216 of drawing 4 which also mentioned this electrode 312 above, and the 2nd auxiliary electrode 217.

[0053] Since each holders 313 and 323 are supported flexibly, the optical

connecter 50 of the above configurations has the advantage by which the impact by the 1st holder 313 and contact between 2nd holder 323 is eased, when the luminescence module 310 and the light-receiving module 320 are combined.

[0054] Drawing 8 thru/or drawing 10 are drawings in which the important section of the display joint structure of the electronic product concerning the 3rd operation gestalt of this invention is shown, and is equipped with the connection unit 330 with which the luminescence module 310 and the light-receiving module 32 are made to connect. The reference mark same here as the reference mark of the drawing previously shown in drawing 6 and drawing 7 is the same member which has the same function.

[0055] Said connection unit 330 is for making optical transmission and electrical connection possible in the condition of having been placed on the long distance, without equipping a body 10 with a display 20 directly. Such a connection unit 330 possesses the optical fiber bundle 340, and the 1st coupler 350 and the 2nd coupler 360.

[0056] The optical fiber bundle 340 is for transmitting each of the light which it was prepared so that each of the luminescence module 310 and the light-receiving module 320 might be faced, and was irradiated from the laser diode array 311 to the photodiode array 321. The 1st coupler 350 combined with said luminescence module 31 is connected with the end of such optical fiber

bundle 340. Moreover, the 2nd coupler 360 combined with the light-receiving

module 320 is connected with the other end of the optical fiber bundle 340.

[0057] Said 1st coupler 350 possesses the light-receiving array 351 which

receives the light irradiated from the laser diode array 311, the 1st holder 353,

the 1st fuselage 355, an elastic member 357, and the hook member 358 and a

release button 359. Said light-receiving array 351 has the same function and the

structure as the photodiode array 321 prepared in the light-receiving module 320.

said 1st holder 353 -- said 2nd holder 323 and outline -- it has the same structure,

and it supports so that the optical fiber bundle 340 and the light-receiving array

351 may be linked.

[0058] Therefore, the light-receiving array 351 is supported by the point exposed

to the outside of the 1st fuselage 355 of the 1st holder 353. The 1st movable

holder 353, an elastic member 357, and said hook member 358 are held in the

interior of said 1st fuselage 355 in and abroad. An elastic member 357 energizes

the 1st holder 353 on the outside of the 1st fuselage 355. Moreover, the passage

holes 354a and 354b are respectively formed in each of the side face of the 1st

fuselage 355, and an apical surface. The end of said hook member 358 is

flexibly supported in the 1st fuselage 355, and the other end is exposed outside

through passage hole 354b.

[0059] And the release button 359 corresponding to passage hole 354a is

formed in the hook member 358. This release button 359 is movable to the inside and outside of the 1st fuselage 355 through passage hole 354a. Therefore, when connecting the 1st coupler 350 with the luminescence module 310, after elastic deformation of the hook member 358 is pressed down and carried out to stop slot 315a formed in the 1st case 315, when it is restored again and stopped by stop slot 315a, connection of the 1st coupler 350 and the luminescence module 310 completes it. And at the time of separation, the luminescence module 310 and the 1st coupler 350 are separable by pressing down a release button 359 by making a stop of the hook member 358 cancel of stop slot 315a.

[0060] Then, the luminescence array 361 to which said 2nd coupler 360 irradiates light, The 2nd holder 363 with which lead-in formation of the lead-in section 364 was carried out from the edge which faces the light-receiving module 320, The 2nd fuselage 365 which holds the 2nd holder 363 so that the lead-in section 364 may be exposed outside, The elastic member 367 which energizes the 2nd holder 363 outside, the hook member 368 prepared in the 2nd fuselage 365 so that it might be stopped by stop slot 325a formed in the apical surface of said 2nd case 325, and a release button 369 are provided.

[0061] Said luminescence array 361 is for irradiating each of the light transmitted through the optical fiber bundle 340 at the photodiode array 321 of the light-receiving module 320. Therefore, the luminescence array 361 has the same

function as the laser diode array 311 and the same structure of the luminescence module 310. Moreover, the luminescence array 261 is supported by the 2nd holder 363 so that it may be exposed to the bottom of the lead-in section 364. The 2nd holder 363 also has the same function as the 1st holder 313, and structure, and it supports so that the luminescence array 261 may be connected with the optical fiber bundle 340. Said 2nd fuselage 365 is the same structure as the 1st fuselage 355, and holds the 2nd holder 363 movable.

[0062] Moreover, an elastic member 367 is formed in the interior of the 2nd fuselage 355. Passage hole 364a in which said release button 369 is inserted free [migration to inside and outside] is formed in the side face of this 2nd holder 363. Moreover, passage hole 364b which the hook member 368 passes is formed also in the apical surface of the 2nd holder 363. Therefore, the end of said hook member 368 is flexibly combined in the 2nd fuselage 365, and the other end is exposed to the exterior of the 2nd fuselage 365. Moreover, it is prepared in the hook member 368 so that a release button 365 may move within and without 2nd fuselage 365 through passage hole 364a. Therefore, if the hook member 368 is stopped by stop slot 325a by elastic deformation, coupling of the 2nd coupler 360 and the light-receiving module 320 will be carried out. And by pressing down a release button 369, where coupling is carried out, the hook member 368 is made to cancel of stop slot 325a, and it is made to dissociate and

deals in the light-receiving module 320 and the 2nd coupler 360.

[0063] On the other hand, two or more guide pins 352 corresponding to the criteria hole 318 of the luminescence module 310 are formed in the 1st coupler

350. This guide pin 352 is manufactured with the conductive quality of the material so that electrical connection may be carried out to the electrode 312 (refer to drawing 10) prepared in the criteria hole 318 at the time of association.

Such a guide pin 352 has the same function as the guide pin 328 prepared in the light-receiving module 320. Moreover, the criteria hole 361 where guide association of the guide pin 328 of the light-receiving module 320 is carried out relatively is formed in the 2nd coupler 360. In the criteria hole 361, the electrode 366 connected to a guide pin 328 is formed movable. This electrode 366 is energized outside by the elastic member. Here, said electrode 366 and guide pin 352 are connected with a mutual electrical-and-electric-equipment target through the optical fiber bundle 340.

[0064] If the optical connector 50 which has said configuration is used, it can be used in the condition of having been isolated in the distance for which it wishes from a body 10, being able to connect a display 20. Drawing 11 shows the important section of the display joint structure of the electronic product concerning the 4th operation gestalt of this invention, and the optical connector 60 is formed in the body 10 and the display 20. An optical connector 60

possesses the luminescence module 410 prepared in the body 10 free

[rotation], and the light-receiving module 420 prepared in the display 20

possible [association with this luminescence module 410].

[0065] Lead-in formation of the lead-in section 414 is carried out at the apical

surface which faces the light-receiving module 420 of said luminescence module

410. Moreover, it is prepared in the interior of the luminescence module 41 so

that the laser diode array 411 may be exposed to the medial surface of the

lead-in section 414. That is, the laser diode array 411 is formed in the condition

of having entered the interior towards the side from the medial surface of the

lead-in section 414. Therefore, the laser diode array 411 comes to face the side

face in the lead-in section 414.

[0066] A lobe 423 protrudes on the apical surface of said light-receiving module

420 so that it may correspond to the lead-in section 414. When inserting in the

flank of said lobe 423 at the lead-in section 414, the photodiode array 421 is

formed so that the laser diode array 411 may be faced at intervals of

predetermined. Where each modules 410 and 420 are separated by being

prepared so that each diode arrays 411 and 421 may face each other by the

inside of the lead-in section 414, even if light is irradiated from the laser diode

array 411, the irradiated light stops thus, going to the exterior of the lead-in

section 414. Therefore, even if it separates a body 10 and a display 20 in the

condition that the laser diode array 411 drives more carelessly, it can prevent that the light irradiated turns on a user.

[0067] Drawing 12 thru/or drawing 14 are drawings in which the display joint structure of the electronic product concerning the 5th operation gestalt of this invention is shown. Drawing 12 is the rough separation perspective view of the display joint structure concerning the 5th operation gestalt, and drawing 13 is the important section sectional view of drawing 12. And drawing 14 is the separation perspective view extracting and showing the important section of drawing 12. Here, since the same reference mark as the reference mark of the drawing previously shown in drawing 2 thru/or drawing 4 is the same member which has the same function, the explanation is omitted.

[0068] The display joint structure shown in drawing 12 thru/or drawing 14 possesses the wearing means 30 for attachment and detachment of a body 10, a display 20, and a body 10 and a display 20, and association, and the optical connector 40 and the attachment-and-detachment include-angle accommodation means of having the luminescence module 210 and the light-receiving module 220.

[0069] Said attachment-and-detachment include-angle accommodation means is for maintaining uniformly the attachment-and-detachment include angle of a display 20 so that it may be detached, attached and equipped with a display 20

only at a predetermined attachment-and-detachment include angle to a body 20.

An attachment-and-detachment include-angle accommodation means

possesses a hinge pin 120, the 1st controller 510 which restricts the

attachment-and-detachment include angle between housing 160, and the 2nd

controller 520 which carries out location restoration of the posture of said

luminescence module 210 so that it may be in agreement with the

attachment-and-detachment include angle adjusted by said 1st controller 510.

[0070] Said 1st controller 510 possesses the stop pin 511 which protruded to the

side face of the fuselage 140 of housing 160, and the covering member 513

prepared in a body 10 so that some hinge pins 120 may be covered. The 1 side

of said covering member 513 is equipped with the guide rail 514 to which it

shows penetration and balking of the stop pin 511 at said

attachment-and-detachment include angle, and the stop slot 515 by which

lead-in formation was carried out so that it might extend in a guide rail 514.

When the stop pin 511 which advanced through the guide rail 514 rotates a

hinge pin 120 as a core, it shows the migration to said stop slot 515, and it

prevents balking and penetration of the stop pin 511 include angles other than

said attachment-and-detachment include angle.

[0071] That is, as shown in drawing 15 A, said stop pin 511 can be moved along

with a guide rail 514 by being located so that it may correspond to a guide rail

514, only when a display 20 is located in the attachment-and-detachment include angle alpha. On the other hand, as shown in drawing 15 B, when a display 20 separates from said attachment-and-detachment include angle alpha, since the stop pin 511 and a guide rail 514 shift, in the stop pin 511, it will be stopped by the guide rail 514. Therefore, in this condition, attachment and detachment of a display 20 are impossible. And since rotation is controlled by the friction member 112 unless a hinge pin 120 receives external force after a display 20 is separated, the attachment-and-detachment include angle alpha is maintained as it is. Therefore, there is inconvenient [no / which should adjust the include angle of a hinge pin 120] at the time of the next wearing.

[0072] On the other hand, since a display 20 is combined at the attachment-and-detachment include angle alpha, said each modules 210 and 220 are also combined at the attachment-and-detachment include angle alpha.

Therefore, it is in the condition that the display 20 was separated, and the luminescence module 210 should be maintained at the attachment-and-detachment include angle alpha for the next association. For this reason, said 2nd controller 520 possesses the rotation spring 525 prepared between the supporter material 521 prepared in a body 10, and the rotation member 523 combined with the luminescence module 210 so that partner rotation may be carried out to this supporter material 521, and the supporter

material 521 and the rotation member 523.

[0073] Said supporter material 521 is formed so that it may be enclosed by the place with covering 12 instead of the hinge pin 130 shown in drawing 3. Such supporter material 521 has tubed 1st hold section 521a which protruded so that it might have a predetermined radius in 1 side, and 2nd hold section 521b. Extended formation of the bore is carried out only for predetermined distance, and the circumferencial direction of 1st hold section 521a is equipped with said 2nd hold section 521b so that stop pawl 521c may be formed on a boundary with 1st hold section 521a.

[0074] Supporter 523a protrudes on the end of said rotation member 523. This supporter 523a has a configuration corresponding to that 1st hold section 521a so that it may be inserted into 1st hold section 521a. Namely, as for supporter 523a, only the section protrudes on a circumferencial direction by the shape of a doughnut in part centering on a rotation core. Moreover, lead-in formation of the piece of support 523b is carried out at each of the both ends severed to the circumferencial direction of said supporter 523a. The edge of the rotation spring 525 is held and supported by each of this piece of support 523b. Therefore, it is surrounded inside supporter 523a and the rotation spring 525 of an outline round shape is formed so that the both ends may be stopped by piece of support 523b. Moreover, as for the rotation spring 525, the both ends are supported by said

stop pawl 521c with Screw S in the supporter material 521 and the rotation member 523 at the time of conclusion.

[0075] On the other hand, the other end of said rotation member 523 is combined with the 1 side of the luminescence module 210 so that it may rotate with the luminescence module 210. For this reason, joint slot 210a in which the other end of the rotation member 523 is inserted is formed in the 1 side of the luminescence module 210. Moreover, rotation stop pawl 210b protrudes inside joint slot 210a. This rotation stop pawl 210b is for preventing from rotating the rotation member 523 freely to the luminescence module 210. Therefore, rotation stop slot 523c corresponding to rotation stop pawl 210b is formed in the other end of the rotation member 523. Moreover, the pressurization spring 527 is formed between the rotation member 523 and the luminescence module 210. This pressurization spring 527 pressurizes the rotation member 523 flexibly at the supporter material 521 side. In order to secure the installation space of this pressurization spring 527, the rotation member 523 has the tubed structure where the other end was opened wide.

[0076] In the above configurations, before applying turning effort to the rotation member 523 at compulsion, as shown in drawing 16 A, the rotation member 523 is located so that it may be surrounded corresponding to the inside of 1st hold section 521a. It is because the motion of the rotation member 523 is controlled

when being supported by stop pawl 521c, after the both ends of the rotation spring 525 have been stopped by piece of support 523b. This condition is in the condition that the luminescence module 210 connected with the rotation member 523 is maintaining the attachment-and-detachment include angle alpha to a body 10. Therefore, the light-receiving module 220 comes to be combined with the luminescence module 210 at the same time the stop pin 511 will advance into the stop slot 515 along with a guide rail 514, if a body 10 is equipped with a display 20 in this condition.

[0077] On the other hand, when making compulsion rotate the display 20 where a display 20 is combined with a body 10, the rotation force came to have shown the rotation member 523 to drawing 16 B. That is, the rotation member 523 is rotated, compressing the rotation spring 525. And the both ends of the rotation spring 525 are moved without interference within the 2nd hold section 521.

[0078] Moreover, also where a display 20 is separated from a body 10, if compulsion is made to rotate the rotation member 523, it can be in the condition of drawing 16 B. If the external force which joined the rotation member 523 in such the condition is removed, the elastic restoring force of the rotation spring 525 will change the auto return of the rotation member 523 again into the condition of drawing 16 A. That is, when the rotation member 523 receives external force, a posture is distorted, but where [free] external force is removed,

it returns to an initial valve position and posture adjustment is carried out so that the luminescence module 210 may maintain the attachment-and-detachment include angle alpha. therefore, the time of equipping a body 10 with a display 20 -- a hinge pin 120 and the light source module 210 -- it is not necessary to adjust each posture

[0079]

[Effect of the Invention] Attachment and detachment of a display are easy for the display joint structure of the electronic product concerning this invention which was mentioned above to a body. Therefore, resolution is more good, or a screen size is exchanged by the large display and it is easy to carry it. Moreover, during a body or a display, any or when a defect occurs in one or a life goes out, it is exchanged simply.

[0080] Moreover, by transmitting a picture signal using light, electromagnetic wave generating is reduced and EMI can be reduced. Moreover, since transmission of a picture signal can connect possible also in the condition of having made the display isolating in the distance of hope from a body using a connection unit, there is the advantage in which it can be used by a user's facilities, locating a display. Moreover, at the time of attachment and detachment of a display, by intercepting a power source automatically, a user's safety increases and there is effectiveness of energy conservation. Moreover,

attachment and detachment and joint actuation are easy by adjusting the set-up
include-angle adjustment automatically [set up the attachment-and-detachment
include angle of a display uniformly, and].

[Translation done.]

* NOTICES *

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] A body and the display which the picture signal from said body is inputted and is displayed, The hinge pin prepared in said body free [rotation] and housing with which said display was equipped so that it might be combined [both] with said hinge pin at the time of wearing and might rotate are included.

The display joint structure of the electronic product characterized by including the wearing means for combining said display with said body, enabling free wearing and free attachment and detachment, and the optical connector which each of said body and said display is equipped with so that mutual correspondence may be carried out, and transmits a picture signal using light.

[Claim 2] Said housing is the display joint structure of the electronic product according to claim 1 characterized by including the housing fuselage which has a front frame and a rear frame and was fixed to said display, and the hinge bracket with which the joint slot which is prepared in said housing fuselage and inserted in relatively [hinge pin / said] at the time of wearing was formed.

[Claim 3] Said wearing means is the display joint structure of the electronic product according to claim 1 characterized by being combined with said body and including further the bearing bracket which supports said hinge pin so that it may be exposed outside.

[Claim 4] Said wearing means is the display joint structure of the electronic product according to claim 1 characterized by including further a locking, and the locking / discharge means for making it cancel for said housing and said hinge pin.

[Claim 5] The locking member prepared free [migration] in said housing so that said locking / discharge means could be combined and canceled to the locking slot formed in the head of said hinge pin, The elastic member which it is prepared [elastic member] in said housing and makes said locking member energize in the direction combined with said locking slot, The display joint structure of the electronic product according to claim 4 characterized by including the release lever which protruded on said locking member so that it

might be exposed to the guide hole formed in said housing and could move.

[Claim 6] The display joint structure of the electronic product according to claim 5 characterized by for the guide slot for guiding association to said locking slot of said locking member to the head of said hinge pin having inclined, and forming it.

[Claim 7] It is the display joint structure of the electronic product according to claim 1 characterized by for said optical connector to contain the light-receiving module prepared in said display so that may have the laser diode array which irradiates light in independent respectively according to a driving signal, it may have the photodiode array which carries out photo electric conversion of the received incident light to the luminescence module which is combined [both] with said hinge pin and rotates in independent respectively, coupling may be carried out [both] to said luminescence module at the time of wearing and it may rotate.

[Claim 8] Said laser diode array is the display joint structure of the electronic product according to claim 7 characterized by being prepared so that it may be exposed to the aforementioned lead-in circles including the 1st holder with which the lead-in section by which said luminescence module is supported by said hinge pin, and said photodiode array is relatively inserted in a plane of union with said light-receiving module was formed.

[Claim 9] Said light-receiving module is the display joint structure of the

electronic product according to claim 7 characterized by to include the 2nd holder with which said photodiode array is supported by the projected point, the base in which the clear aperture for be prepared in said display and support said 2nd holder movable in and abroad was formed, and the elastic member made to energize so that it may be prepared in the interior of said base and said 2nd holder may be exposed outside through said clear aperture.

[Claim 10] Said optical connecter is the display joint structure of the electronic product according to claim 7 characterized by including further the positioning means for guiding wearing of said luminescence module and said light-receiving module, and preventing a ranging behavior at the time of wearing.

[Claim 11] Said positioning means is the joint structure of the electronic product according to claim 10 characterized by including the guide pin prepared in the remaining modules so that the plane of union of said luminescence module or said light-receiving module might be countered in two or more criteria holes by which lead-in formation was carried out, and said criteria hole and said luminescence module or a light-receiving module might be countered, and the pressurization member for energizing the 1 side of said luminescence module to the shaft orientations of said hinge pin.

[Claim 12] as said wearing means -- the inside of said each criteria hole -- flexible -- a round trip -- with the 1st Maine electrode of the pair prepared

movable The pressurization member which pressurizes each of said 1st Maine electrode flexibly outside is included. Said guide pin The display joint structure of the electronic product according to claim 11 which electrical connection is carried out to each of said 1st Maine electrode at the time of wearing, and is characterized by including the 2nd Maine electrode of the pair formed with the conductive quality of the material so that the Maine power source between said bodies and said displays might be connected.

[Claim 13] The display joint structure of the electronic product according to claim 12 characterized by including further a switching means to cut gradually energization between said 1st Maine electrodes and said 2nd Maine electrodes, or to connect it, at the time of separation or wearing of said body and said display.

[Claim 14] The interior of said luminescence module is equipped with said switching means so that it may correspond to each of said 1st Maine electrode. The elastic switch of the pair located in the isolation distance which is different from each other from said 1st Maine electrode so that said 1st Maine electrode may be gradually contacted / separated at the time of approach and isolation is included. The display joint structure of the electronic product according to claim 13 characterized by coming to separate the 1st Maine electrode and said 2nd Maine electrode after each of said elastic switch and said 1st Maine electrode is

gradually separated at the time of separation.

[Claim 15] The 1st holder supported that lead-in formation of the lead-in section in which said photodiode array is inserted at the time of wearing is carried out at an apical surface, and said luminescence module has so that [said laser diode array] it may be exposed to the aforementioned lead-in circles, The 1st case which supports said 1st holder movable in and abroad so that the aforementioned lead-in section may meet said light-receiving module, and is prepared in said body free [rotation], The display joint structure of the electronic product according to claim 7 characterized by including the elastic member which is prepared in said 1st case and energizes said 1st holder outside.

[Claim 16] Said optical connector is the display joint structure of the electronic product according to claim 7 characterized by including further the connection unit for making it connect so that the optical transmission of said luminescence module and said light-receiving module can be carried out on a long distance.

[Claim 17] The optical fiber bundle for transmitting each of the light which said connection unit was prepared so that said luminescence module and said light-receiving module might be faced, and was irradiated from said laser diode array to said light-receiving module, The 1st coupler which combines the end of said optical fiber bundle so that said luminescence module may be faced, The display joint structure of the electronic product according to claim 16

characterized by including the 2nd coupler which combines the other end of said optical fiber bundle so that said light-receiving module may be faced.

[Claim 18] A light-receiving array for said 1st coupler to receive each of the light irradiated from said luminescence module, The 1st holder supported so that said light-receiving array may be connected with a point by the end of said optical fiber bundle, The 1st fuselage in which said 1st holder was supported movable in and abroad, and the passage hole was formed, The elastic member prepared in said 1st fuselage so that said 1st holder might be energized outside, The hook member prepared in said 1st fuselage so that it might be stopped by the stop slot formed in said luminescence module while elastic deformation was carried out at the time of association, The display joint structure of the electronic product according to claim 17 characterized by including the release button prepared in and abroad movable through said passage hole in order to cancel association of said hook member.

[Claim 19] A luminescence array for said 2nd coupler to irradiate each of the light transmitted through said optical fiber bundle, The 2nd holder supported so that said luminescence array may be connected with a point by the other end of said optical fiber bundle, The 2nd fuselage in which said 2nd holder was supported free [migration to inside and outside], and the passage hole was formed, The elastic member prepared in said 2nd fuselage so that said 2nd holder may be

energized outside, The hook member prepared in said 2nd fuselage so that it might be stopped by the stop slot formed in said light-receiving module while elastic deformation was carried out at the time of association, The display joint structure of the electronic product according to claim 17 characterized by including the release button prepared in and abroad movable through said passage hole in order to cancel association of said hook member.

[Claim 20] The display joint structure of the electronic product according to claim 7 characterized by intercepting alternatively power-source connection to said luminescence module and said light-receiving module, or connecting it, and including further the current supply / a cutoff means to interrupt the drive of said laser diode at the time of separation, according to separation and wearing of said display and said body.

[Claim 21] Said current supply / cutoff means The auxiliary power for the drive of said laser diode array, The mechanical component which it prepares

[mechanical component] for said body and makes said laser diode drive, The 1st auxiliary electrode of a pair with which it is prepared in said luminescence module, and the each is electrically connected with each of said mechanical component and said auxiliary power, It is prepared in said light-receiving module so that it may connect with said each 1st auxiliary electrode at the time of association of each of said module. The display joint structure of the electronic

product according to claim 20 characterized by including the 2nd auxiliary electrode of a pair respectively connected electrically so that the power of said auxiliary power might be told to said mechanical component through said 1st auxiliary electrode.

[Claim 22] Said current supply / cutoff means are formed in the interior of said luminescence module so that it may correspond to each of said 1st auxiliary electrode. It is located in the isolation distance which is different from each other from said 1st auxiliary electrode so that it may energize or connect with said 1st auxiliary electrode and phase target too hastily, while elastic deformation is carried out at the time of wearing or separation. The display joint structure of the electronic product according to claim 21 characterized by including further the gang switch of a pair electrically connected with each of said mechanical component and said auxiliary power.

[Claim 23] The display joint structure of the electronic product according to claim 1 characterized by including further the attachment-and-detachment include-angle accommodation means which restricts attachment and detachment of the display so that said display can detach and attach only at a predetermined attachment-and-detachment include angle to said body, and makes wearing easy.

[Claim 24] Said attachment-and-detachment include-angle accommodation

means is the display joint structure of the electronic product according to claim 23 characterized by including said hinge pin, the 1st controller which restricts the attachment-and-detachment include angle of said housing, and the 2nd controller for restoring the posture of said optical connector automatically [so that it may be in agreement with the attachment-and-detachment include angle adjusted by said 1st controller].

[Claim 25] The stop pin by which said 1st controller protruded to the side face of said housing, The guide rail to which it is prepared in said body so that said some of hinge pins may be covered, and it is formed in the side corresponding to said stop pin, and shows the path of insertion of said stop pin, The display joint structure of the electronic product according to claim 24 characterized by including the covering member which has the stop slot by which lead-in formation was carried out by extending in said guide rail so that attachment and detachment of said stop pin might be controlled out of said attachment-and-detachment include angle.

[Claim 26] The tubed 1st hold section which said 2nd controller was prepared in said body, and protruded on the 1 side in the predetermined radius, The supporter material to which only predetermined distance has the 2nd hold section by which extended formation of the bore was carried out in a circumferencial direction from the inside of the 1st hold section so that a stop

pawl may be formed from a boundary with said 1st hold section, The rotation member to which the supporter protruded on the circumferencial direction so that an end might be combined with said optical connecter, the other end might be held in said 1st hold circles free [rotation] and it might correspond to said 1st hold section, It is prepared between said rotation members and said supporter material so that it may be alternatively supported by the edge each [edge] of both ends was severed to the circumferencial direction of said supporter, and said stop pawl. The rotation spring which offers stability is included in said rotation member by pushing an end on said piece of support, and deforming it flexibly at the time of rotation of said rotation member. Said rotation member The display joint structure of the electronic product according to claim 24 characterized by being positioned so that it may rotate according to the rotation force of said rotation spring and said attachment-and-detachment include angle may be maintained.

[Claim 27] Said 2nd controller is the display joint structure of the electronic product according to claim 26 characterized by including further the pressurization spring which is prepared between said rotation members and said optical connecters, and pressurizes said rotation member flexibly at said supporter material side.

[Claim 28] The joint slot by which lead-in formation was carried out so that said

rotation member might be inserted in the 1 side of said optical connector. The rotation stop pawl projected from the joint slot inside so that relative rotation might be prevented is formed. The display joint structure of the electronic product according to claim 26 characterized by carrying out lead-in formation of the rotation stop slot corresponding to said rotation stop pawl from a periphery in the joint edge inserted in said joint slot of said rotation member.

[Claim 29] said laser diode array be the display joint structure of the electronic product according to claim 7 characterize by to have came to prevent that be prepare so that it may be expose to the plane of union of said luminescence module to the medial surface of the lead-in section by which lead-in formation be carried out , said photodiode array be prepare so that it may be expose to the side face of the lobe corresponding to the aforementioned lead-in section of said light-receiving module , and the light irradiate from said laser diode array go to the outside of the aforementioned lead-in section .

[Translation done.]